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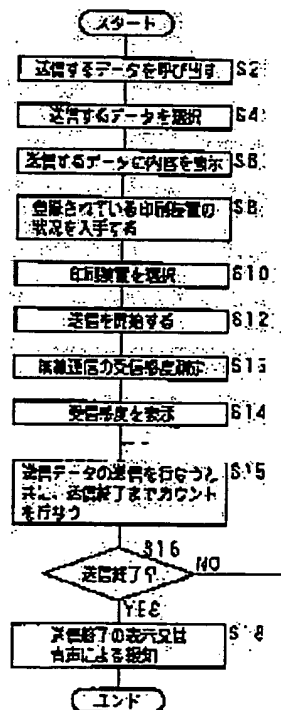
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(54) INFORMATION APPARATUS



(57)Abstract:

PROBLEM TO BE SOLVED: To provide an information apparatus capable of transmitting data to a printer by radio communication, printing the transmitted data, and suppressing the occurrence of transmission errors during the transmission of data.

SOLUTION: The information apparatus, which transmits (S15) data to the printer by radio communication and prints the transmitted data, is provided with a measuring means S13 measuring the reception sensitivity of the radio communication and a means S14 displaying the reception sensitivity measured by the measuring means S13.

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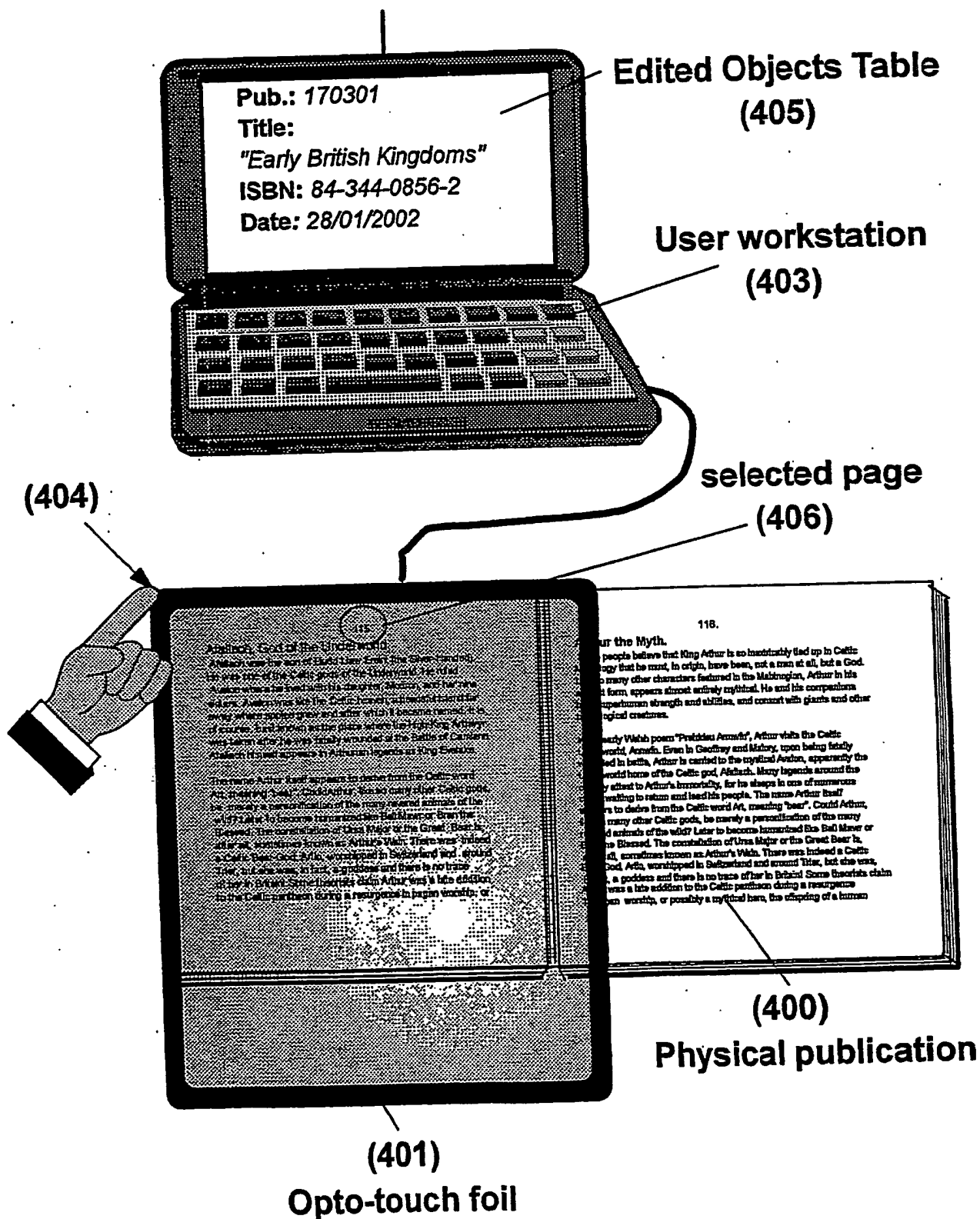


Fig. 4: The user selects a page of physical publication and places
 transparent opto-touch foil over the selected page

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to amelioration of the information machines and equipment which data are transmitted [information machines and equipment] to a printer by radio and make the transmitted data print.

[0002]

[Description of the Prior Art] With the spread of personal computers in recent years, the spread of the peripheral device is also remarkable, and the printer has spread also not only in a company but in an individual user. In order that a personal computer and a printer may take the gestalt connected with a parallel cable etc., it is difficult to move a personal computer, where [usual] a personal computer and a printer are connected. However, in recent years, whenever it made it print in the user who the note type personal computer has spread [user] and moves the service space of a personal computer, since the personal computer and the printer had to be reconnected and connection/isolation was repeated, while degradation of a parallel cable and its connector progressed, there was a problem that it was not user-friendly for a user.

[0003] Although canceled by making wireless connection of a personal computer and the printer, the problem mentioned above In JP,9-93672,A, when it is in the condition that information machines and equipment and printers, such as a personal computer, can communicate on radio "The print control unit and the approach" a user grasps the condition of a current printer are indicated by asking from information machines and equipment to a printer at fixed spacing, and always displaying the condition of a printer in the form of an icon on the screen of information machines and equipment. Since it becomes possible to get to know that printing processing was completed and the condition of a printer can be recognized in the phase before printing by this while printing, the futility which performs printing actuation in the condition [that it cannot print] can be removed.

[0004]

[Problem(s) to be Solved by the Invention] It is premised on the ability to radiocommunicate between a printer and information machines and equipment by "the print control unit and approach" which were mentioned above. When recognition of the condition of a printer is enabled, for example, pocket mold information machines and equipment (mobile computing devices) like a note type personal computer as information machines and equipment are assumed, even if printing good / failure can be judged by the information-machines-and-equipment side Since it may become a transmitting error, while transmitting print data, information machines and equipment cannot be moved, and the advantage which uses radio cannot fully be utilized.

[0005] That is, when transmitting data to the printer by which the installation location was fixed from the information machines and equipment with which the installation location was fixed like a desktop mold personal computer Since each is installed in consideration of the distance by wireless which can be communicated, the distance which can be communicated does not become a problem, but in performing radio using pocket mold information machines and equipment When a transmitting person moves freely during transmission of data, it comes out of [which can be communicated / the] distance, and there is a problem that a transmitting error may occur. This invention is made in view of a situation which was mentioned above, and it aims at offering the information machines and equipment which can control generating of a transmitting error during transmission of data while transmitting data to a printer by radio and making the transmitted data

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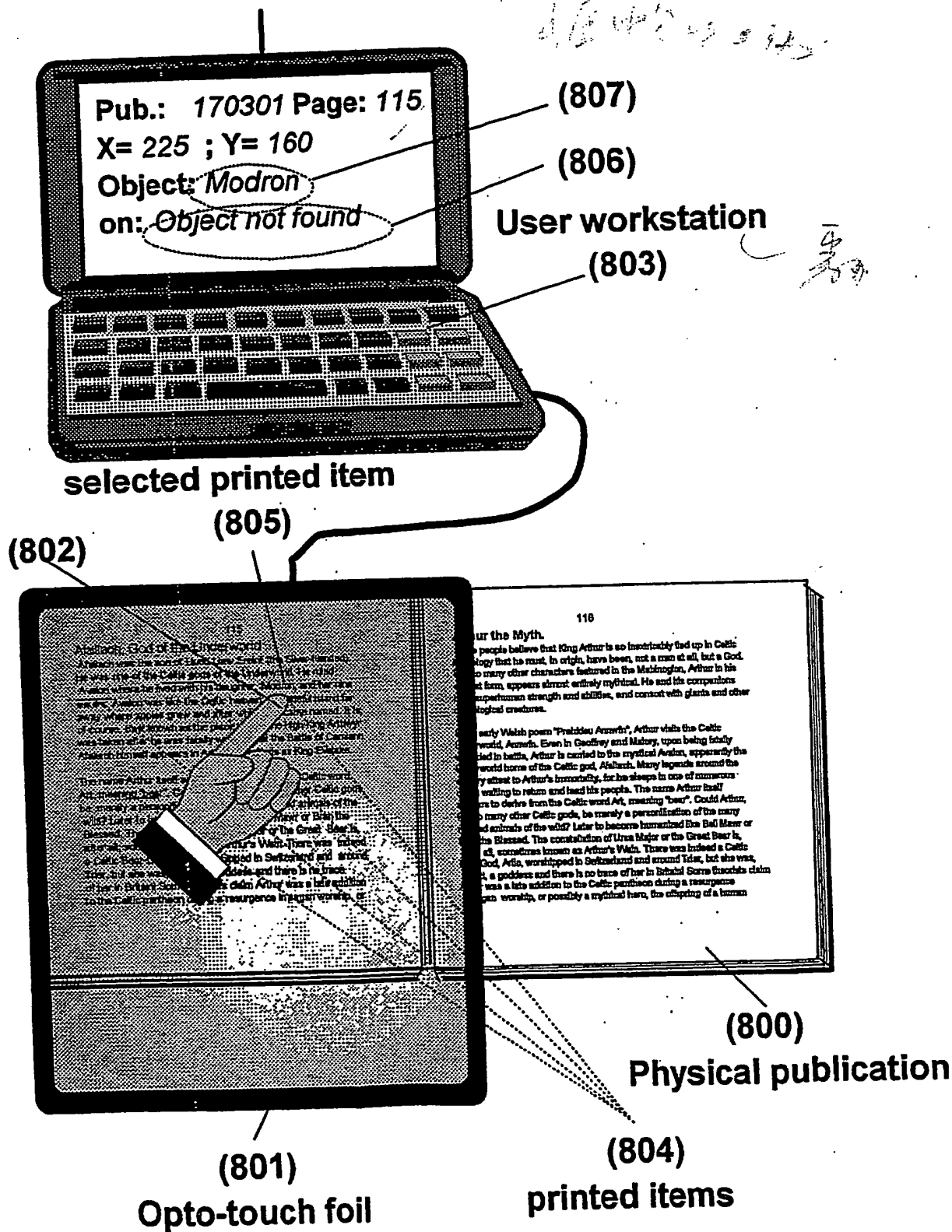


Fig. 8: The user touches the opto-touch foil over another item

print.

[0006]

[Means for Solving the Problem] The information machines and equipment concerning this invention are characterized by having a measurement means to measure the receiving sensibility of said radio, and a means to display the receiving sensibility which this measurement means measured in the information machines and equipment which data are transmitted [information machines and equipment] to a printer by radio and make the transmitted data print.

[0007] Data are transmitted to a printer by radio and the transmitted data are made to print in these information machines and equipment. A means by which a measurement means measures and displays the receiving sensibility of radio displays the receiving sensibility which the measurement means measured. Since it becomes possible in the condition with the good receiving sensibility of radio to move information machines and equipment since information machines and equipment display the receiving sensibility of radio, and the sensibility of radio can avoid printing in the bad condition by this, generating of a transmitting error of print data can be controlled.

[0008] Moreover, the information machines and equipment concerning this invention are characterized by having further a detection means to detect degradation of the receiving sensibility which said measurement means measured, and a means by which voice reports this degradation when said detection means detects degradation of receiving sensibility during transmission of said data.

[0009] Since a means report reports that degradation with voice when a detection means detects degradation of the receiving sensibility which the measurement means measured in these information machines and equipment and a detection means detects degradation of receiving sensibility during transmission of data, the situation which becomes with a transmitting error in print data can be recognized immediately, and a user can control generating of a transmitting error.

[0010] Moreover, the information machines and equipment concerning this invention are characterized by having further a means to calculate the duration for transmitting data to said printer, and a means to display the duration which this means calculated.

[0011] Calculate, and since a means by which a means to calculate displays the duration for transmitting data to a printer in these information machines and equipment displays that calculated duration, a user Before performing actuation for printing, after being able to recognize the duration for transmitting print data and performing actuation for printing, the duration can be checked, information machines and equipment can be moved, and generating of an unexpected transmitting error can be controlled.

[0012] Moreover, the information machines and equipment concerning this invention are characterized by having further a count means to calculate a residual duration, and a means to display the duration of the remainder which this count means calculated, during data transmission to said printer.

[0013] In these information machines and equipment, since the means which a count means calculates a residual duration and displays displays the duration of the remainder which the count means calculated during data transmission to a printer, while a user can recognize the transmitting situation of print data and being able to recognize promptly the fault produced during transmission of print data, a user's mental stress by waiting for transmitting termination of print data is mitigable.

[0014] Moreover, the information machines and equipment concerning this invention are

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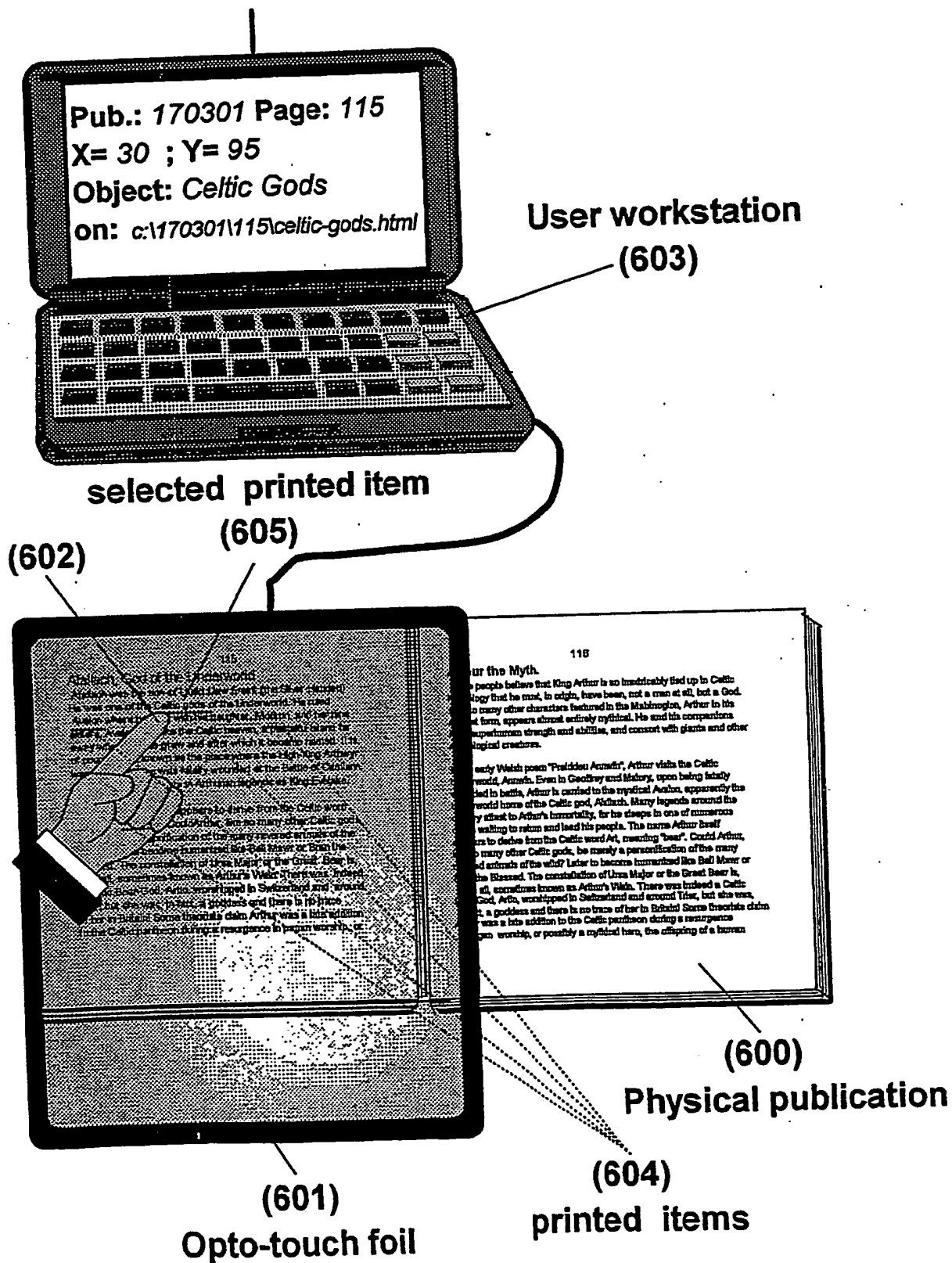


Fig. 6: The user touches the opto-touch foil over a selected printed

characterized by having further a means by which voice reports that transmission of said data was completed, when the duration of the remainder which said count means calculated is set to 0.

[0015] Since a means to report reports with voice that transmission of print data was completed when the duration of the remainder which the count means calculated is set to 0 in these information machines and equipment, it a user Doing other activities, after being able to recognize transmitting termination of print data, without seeing the display of information machines and equipment etc. and performing actuation for printing, transmitting termination of print data can be known and it can know that information machines and equipment may be moved.

[0016] Moreover, the information machines and equipment concerning this invention are characterized by having further a means to receive the information about the waiting for printing from said printer, and a means to display the information which this means received.

[0017] In these information machines and equipment, since a means to receive displays the information which the means which a means to receive the information about the waiting for printing and to display receives received, after it performs actuation for printing from a printer, it can expect that that printout is overdue.

[0018]

[Embodiment of the Invention] Below, this invention is explained based on the drawing in which the gestalt of the operation is shown. With the gestalt of this operation, since Bluetooth (Bluetooth) is used as a means to connect a printer and information machines and equipment by radio, the telecommunications standard of Bluetooth etc. is explained below. The frequency band used by Bluetooth is a 2.4GHz band currently assigned to the wireless LAN (LocalArea Network) of medium speed in Japan. This frequency band is internationally used as ISM (Industrial Scientific Medical) bands (industrial scientific medical band; 2400MHz - 2483.5 MHz), such as a microwave oven and medical equipment, and Bluetooth also entered as a wireless device of minute power with unnecessary wireless license.

[0019] Therefore, this frequency band is disorderly and it is a frequency environment with many interference and noises, and when using an ISM band for a communication link, it is obliged to use a spectrum diffusion method from Japan-Europe rice. In Bluetooth, the frequency-hopping spectrum diffusion method (SSFH; Spread Spectrum Frequency Hopping) is adopted. A frequency-hopping spectrum diffusion method is a method which changes and transmits the frequency of a subcarrier for every fixed time amount (frequency hopping), and it is hard to interfere in it to the communication link of an alien system, and it cannot receive the interference from the communication link of an alien system easily, either.

[0020] Although the carrier frequency of Bluetooth is an ISM band as mentioned above, 2471MHz - 2497MHz is to be used for it among those in Japan. A modulation technique is a binary frequency shift keying method (0.5BT Gaussian filter 2FSK1M symbol / second, modulation indexes 0.28-0.35), and frequency hopping is 1600 hop / second (1MHz spacing) in the time of normal operation, and has five kinds of different hopping sequences.

[0021] The Bluetooth channel has a 1MHz band, respectively, and frequency hopping is performed over 79 channels (Japan 23 channels). Since modulation techniques are 2FSK, a subcarrier shifts between two frequencies showing "1" and "0." In this modulation technique, the amplitude and a phase do not have big semantics. For a class 1, 1mW - 100mW and a class 2 are [0.25mW - 2.5mW and the class 3 of transmitted power] 1mW. a data transfer rate -- an asynchronous channel -- a maximum of 721 of an unsymmetrical link -- they are k bits per second

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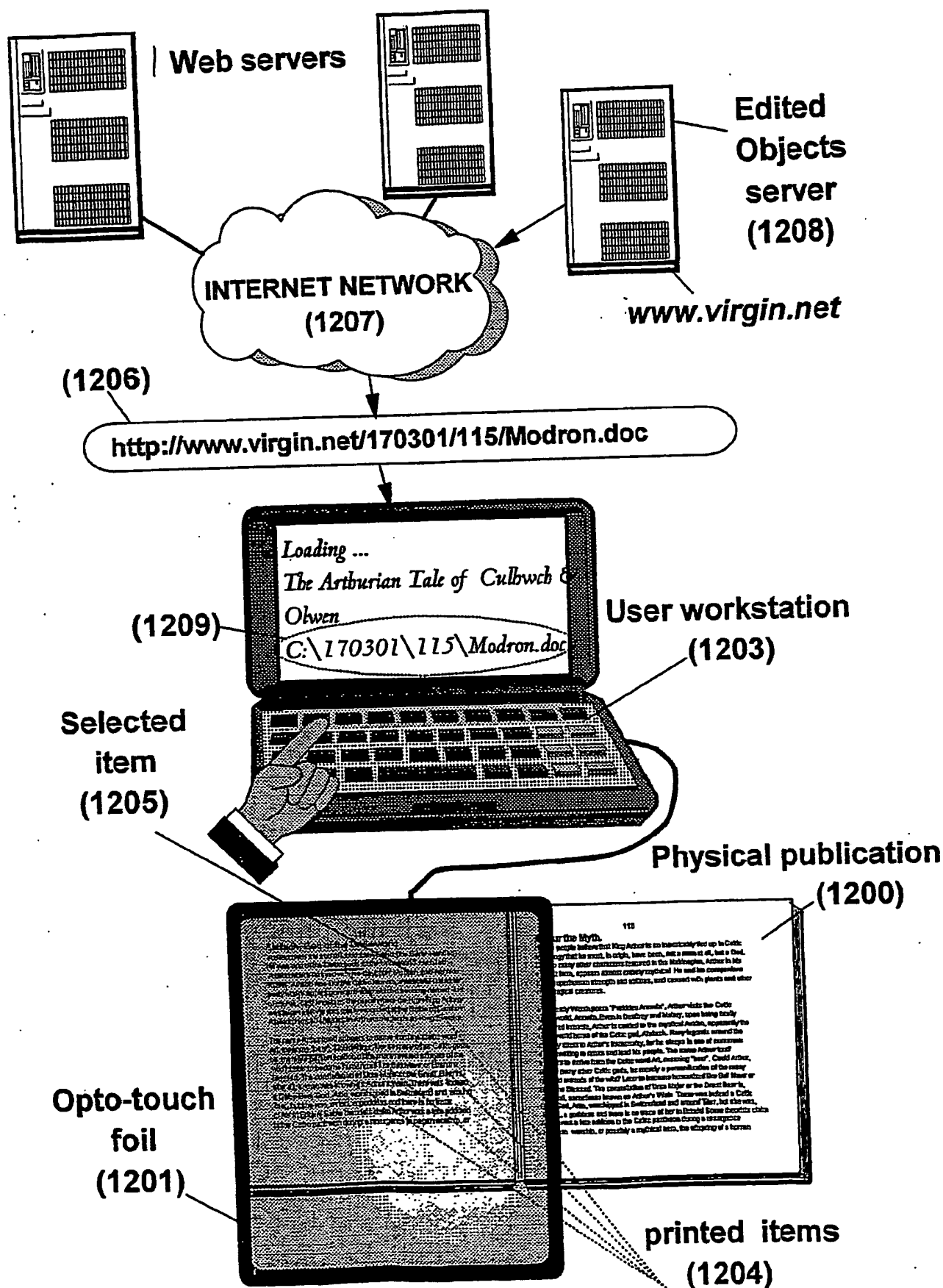


Fig. 12: The requested edited object is received from the Edited Objects server and is stored on the user workstation

(direction of return 57.6k bits per second), and 432.6k bits per second of a symmetry link (since the thing with a data transfer rate lower than 1M symbol / second has an overhead peculiar to a protocol).

[0022] A link control unit (link controller) takes charge of a probability, power save, an error correction (FEC;Forward Error Correction), authentication, encryption, etc. of network connection. The Bluetooth walkie-talkie operates as either a master unit and a slave unit. A link manager establishes the connection between a master unit and a slave unit. A master unit can be communicated to a maximum of seven sets of slave units, and coincidence, it is also possible to register 200 or more sets of slave units into others, and this control area is defined as a "pico network."

[0023] The master unit of a certain pico network can be operated as a slave unit to the master unit of another pico network. The network of a pico network is called a "SUKYATTA network." In many cases, the slave unit of these pico network and a SUKYATTA network is a standby mode, and is reducing power consumption.

[0024] The frequency band of Bluetooth is divided into the time slot (TDD;Time Division Duplexing; time-sharing both directions), and each slot corresponds to RF hop frequency of one **. A master unit transmits by the time slot of an even number, and a slave unit transmits by the time slot of an odd number. The bit string of the data inside a pico network (voice and an image are included) is transmitted by the packet. There are one time slot, three time slots, and five time slots in a packet size. One packet consists of an access code, a header, and a payload.

[0025] Drawing 1 is an explanatory view for explaining the example of the structure of a system in connection with image formation equipment which used Bluetooth mentioned above for radio. On the networks NW, such as LAN, various personal digital assistants 31 and 32, the desktop mold terminal 33, note type terminals 34, and terminals (information machines and equipment) like a cellular phone 35 are connected by the cable or wireless, and this system is constituted. Respectively possible [the Bluetooth unit 43 / the Bluetooth unit 44] for desorption to the note type terminal 34, it fixes and the Bluetooth units 41 and 42 are connected at personal digital assistants 31 and 32 at the desktop mold terminal 33. The Bluetooth unit is beforehand built in the cellular phone 35.

[0026] On Network NW, the various airline printers 11, 12, 13, and 14 (printer) are connected by the cable or wireless, possible [desorption], it fixes and the Bluetooth units 21, 22, 23, and 24 are connected to airline printers 11, 12, 13, and 14, respectively. Each Bluetooth units 41, 42, 43, and 44 and a cellular phone 35 (the same is said of Bluetooth units 21, 22, 23, and 24) are changing the dispatch frequency, as shown in drawing 2 , respectively, and recognize the existence of reception by time-sharing processing for every [as shown in drawing 2] frequency in the receive section of each Bluetooth units 41, 42, 43, and 44 and a cellular phone 35 so that it may not interfere with other Bluetooth units. And a reception place is specified with the recognized frequency.

[0027] Drawing 3 is the block diagram showing the example of a configuration of the Bluetooth unit. This Bluetooth unit divides roughly, consists of the baseband section 200, an RF section transmitter 201, and an RF section receiver 202, and consists of the microprocessor 103, the DSP (DigitalSignal Processor) baseband processor 101 and I/O Port 106 which operate with the clock signal from a clock 102, and ROM104 and the flash ROM which a microprocessor 103 uses in the baseband section 200.

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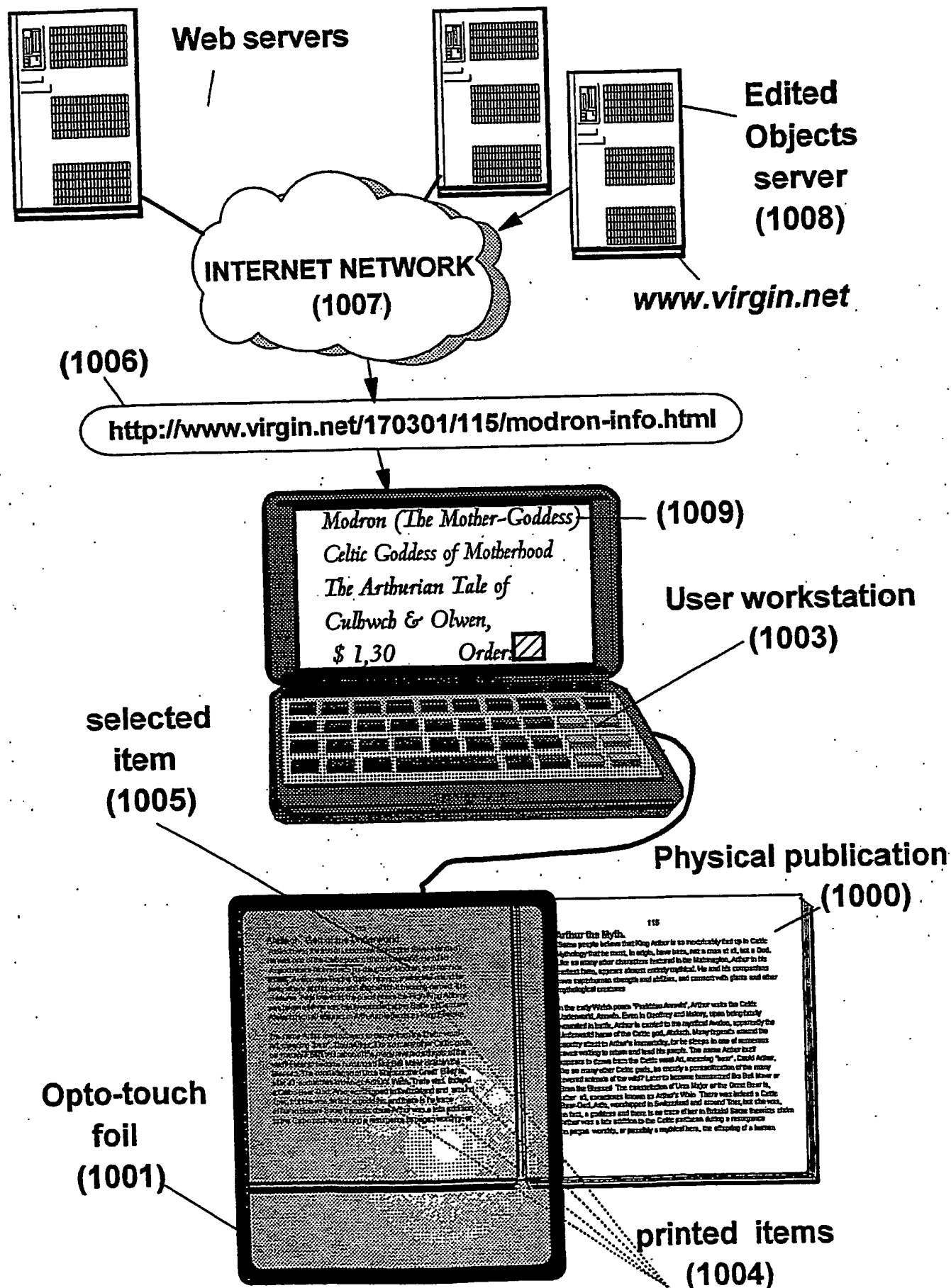


Fig. 10: A description of the edited object and ordering information are

[0028] I/O Port 106 delivers and receives CPU100 and the signal to which the Bluetooth unit was connected by fixing possible [description] and which an airline printer 1 contains, for example. The DSP baseband processor 101 is controlled from a microprocessor 103, and gives the digital baseband signaling containing transmit data to the RF section transmitter 201. D/A converter 110 changes into an analog signal the baseband signaling with which the RF section transmitter 201 was given. After this analog signal is filtered with a low pass filter 111, FM modulation of it is carried out with FM modulator 112. FM modulator 112 carries out FM modulation by the subcarrier which the oscillator 205 which received frequency-hopping control from the DSP baseband processor 101 outputted. The oscillator 205 is built in the RF section receiver 202, and with a switch 206, it connects with an FM modulator 112 side at the time of transmission, and it connects it to a mixer 207 side, respectively at the time of reception.

[0029] After a burst modulation is carried out further, through a switch 204, the modulating signal by which FM modulation was carried out with FM modulator 112 is filtered by the burst modulator 113 with the RF filter 131, and is transmitted from an antenna 203 by it. a switch 204 -- by the switch driver 130, it connects with the RF section transmitter 201 side at the time of transmission, and the RF filter 131 and an antenna 203 are connected to the RF section receiver 202 side, respectively at the time of reception.

[0030] After the input signal received by the antenna 203 is filtered with the RF filter 131, it is given to the RF section receiver 202 through a switch 204. After the input signal given to the RF section receiver 202 is amplified, it is filtered with the band filter 208. After being mixed with the local oscillation signalling frequency which the oscillator 205 which received frequency-hopping control from the DSP baseband processor 101 outputted with a mixer 207 and changing into an intermediate frequency signal the input signal filtered with the band filter 208, it is filtered by IF filter 122 and it restores to it with FM demodulator 121. The recovery signal to which it restored with FM demodulator 121 is changed into a digital signal by the threshold detector / clock recovery 120, and is given to the DSP baseband processor 101. The digital signal given to the DSP baseband processor 101 is given to CPU100 of an airline printer 1 according to the contents.

[0031] Drawing 4 is the block diagram showing each important section configuration which becomes common [the terminal unit which is the gestalt of operation of the information machines and equipment concerning this invention, and are the personal digital assistants 31 and 32 in drawing 1 , the desktop mold terminal 33, the note type terminal 34, and a cellular phone 35]. This terminal unit is connected with the loudspeaker control section 59 which carries out drive control of the loudspeaker 60 at the display 61 in which CPU56 includes ROM57, RAM58, a liquid crystal display, and its control circuit by bus 50, the control unit 62, the Bluetooth unit 54 as shown in drawing 3 , and the list. ROM57 (here, rewriting good / failure shall not ask) builds in count section 57a, count-area 57b, etc. Various data files etc. memorize RAM58 (here, volatility/non-volatile shall not be asked) while it builds in transceiver image memory 58a.

[0032] Below, it explains, referring to the flow chart of drawing 5 which shows it for actuation of such a terminal unit of a configuration. A terminal unit will be displayed on a display 61 like the screen which shows the list of the files set as the printing object in RAM58 (data) to a call and drawing 6 (a), if actuation of a printing demand is performed in a control unit 62 (S2). In a control unit 62, a terminal unit will be displayed on a display 61 like the screen which shows (S4) and the contents of the selected file (data) to drawing 6 (b), if selection actuation from the list of the displayed files (S2) is performed (S6). These contents are the attributes of a file, for example, are a

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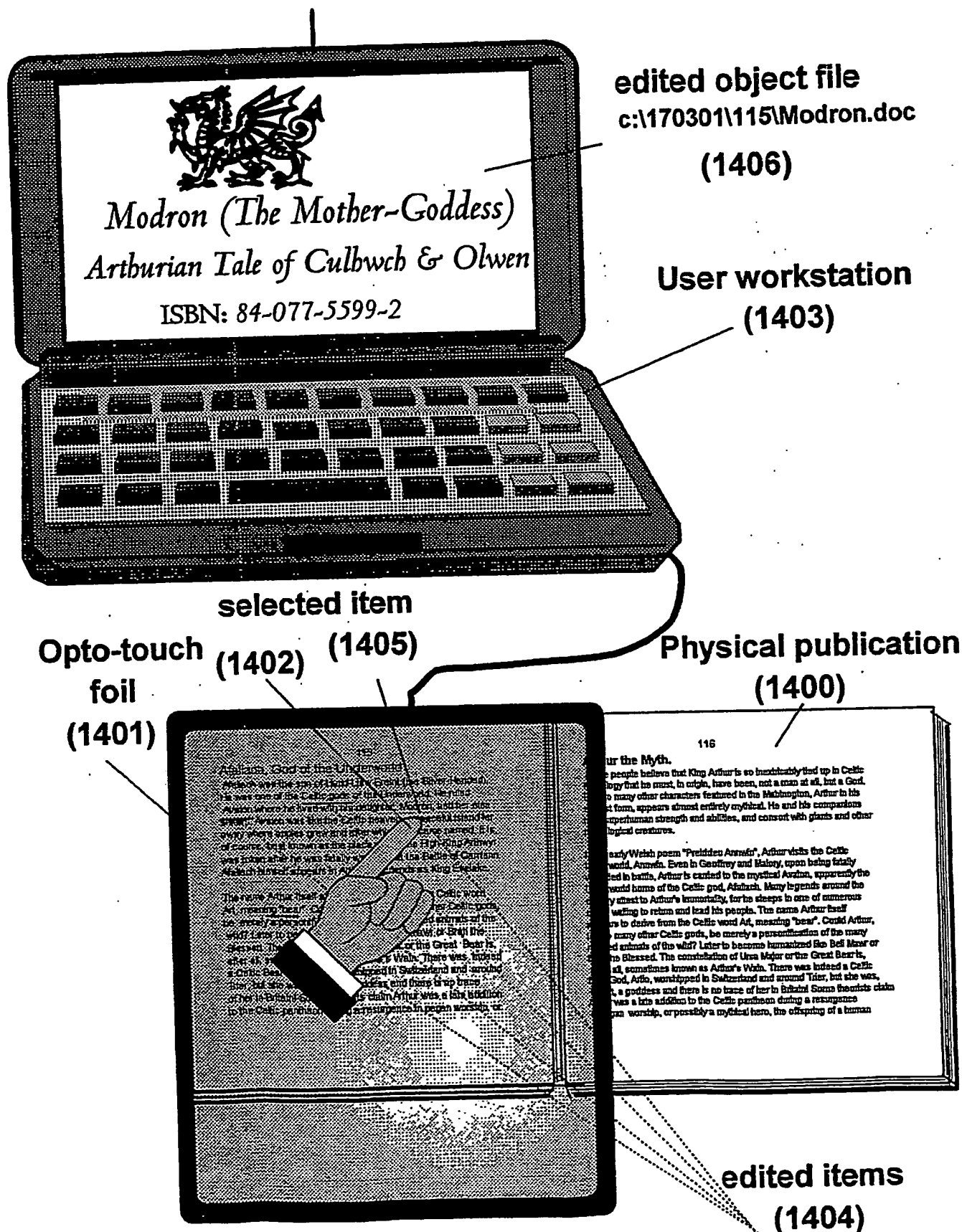


Fig. 14: When the user selects a printed item on the opto-touch foil, the associated edited object is retrieved and displayed on the user workstation.

name, a class, size, etc. of a file.

[0033] A terminal unit receives next the situation of the airline printer registered into the terminal unit, and displays it on a display 61 like the screen shown in drawing 6 (c) (S8). The situation of an airline printer is given to the Bluetooth unit (41, 42, 43, 44, 35 (drawing 1)) connected to the terminal unit from the Bluetooth unit (21, 22, 23, 24 (drawing 1)) connected to the airline printer, for example, is airline printer information, and are a color / monochrome printing classification, a page / Rhine printing method, a model name, the propriety of radio, and waiting job for printing (waiting for printing) several grades. The number of the waiting jobs for printing is the number of printing demands which the airline printer already received. (Claim 6)

[0034] In a control unit 62, a terminal unit will start transmission of print data, if selection actuation from the airline printer (S8) displayed on the display 61 is performed (S10) (S12). While a terminal unit calculates the duration of transmission from the size of print data, and the transmitting rate of the Bluetooth unit by count section 57a at this time The receiving sensibility of the radio of the Bluetooth unit is measured (S13), and while displaying the words of "transmitting data", and the calculated rough time amount on a display 61 like the screen shown in drawing 6 (d), the receiving sensibility of the measured radio is displayed on a display 61 (S14). (Claims 1 and 3)

[0035] The data signal conveyed with a specific pattern is beforehand transmitted to a transmitting phase hand, and it detects periodically how much the pattern was received to accuracy during image data transmission, and you may make it measure receiving sensibility about the measurement means of the receiving sensibility of radio, based on the detection result, for example as indicated by JP,5-75553,A.

[0036] While transmitting print data, by carrying out counting of the amount of transmission of print data by count-area 57b, a terminal unit calculates residual transmitting station important point time amount, and displays the language "under data transmission", the transmitting station important point time amount of the calculated remainder, and the receiving sensibility of the radio of the Bluetooth unit on a display 61 like the screen shown in drawing 6 (e) (S15). (Claim 2)

[0037] It is that a terminal unit displays the receiving sensibility of radio like [also while transmitting print data] the screen shown in drawing 6 (e), and updates the display at any time, and a user can move a terminal unit in the highly sensitive range also in print-data transmission. However, a user is inconvenient by the display of receiving sensibility always being seen. Then, when the receiving sensibility of radio deteriorates, voice reports the degradation from a loudspeaker 60. (Claim 5)

Thereby, the portability can be raised when a terminal unit is a personal digital assistant.

[0038] If the transmitting station important point time amount of the remainder calculated by count-area 57b is set to 0 and transmission of print data ends a terminal unit (S16), while displaying the words of "data transmission was completed" on a display 61, voice will report that data transmission was completed from a loudspeaker 60 like the screen shown in drawing 6 (f) (S18). (Claim 4)

Thereby, a user can know that data transmission was completed, without seeing a display 61. In addition, as for each voice from the loudspeaker 60 mentioned above, it is desirable to change the sound reported to transmitting termination of print data and the sound which reports receiving sensibility degradation of radio. Moreover, you may make it the language by people's voice report, respectively.

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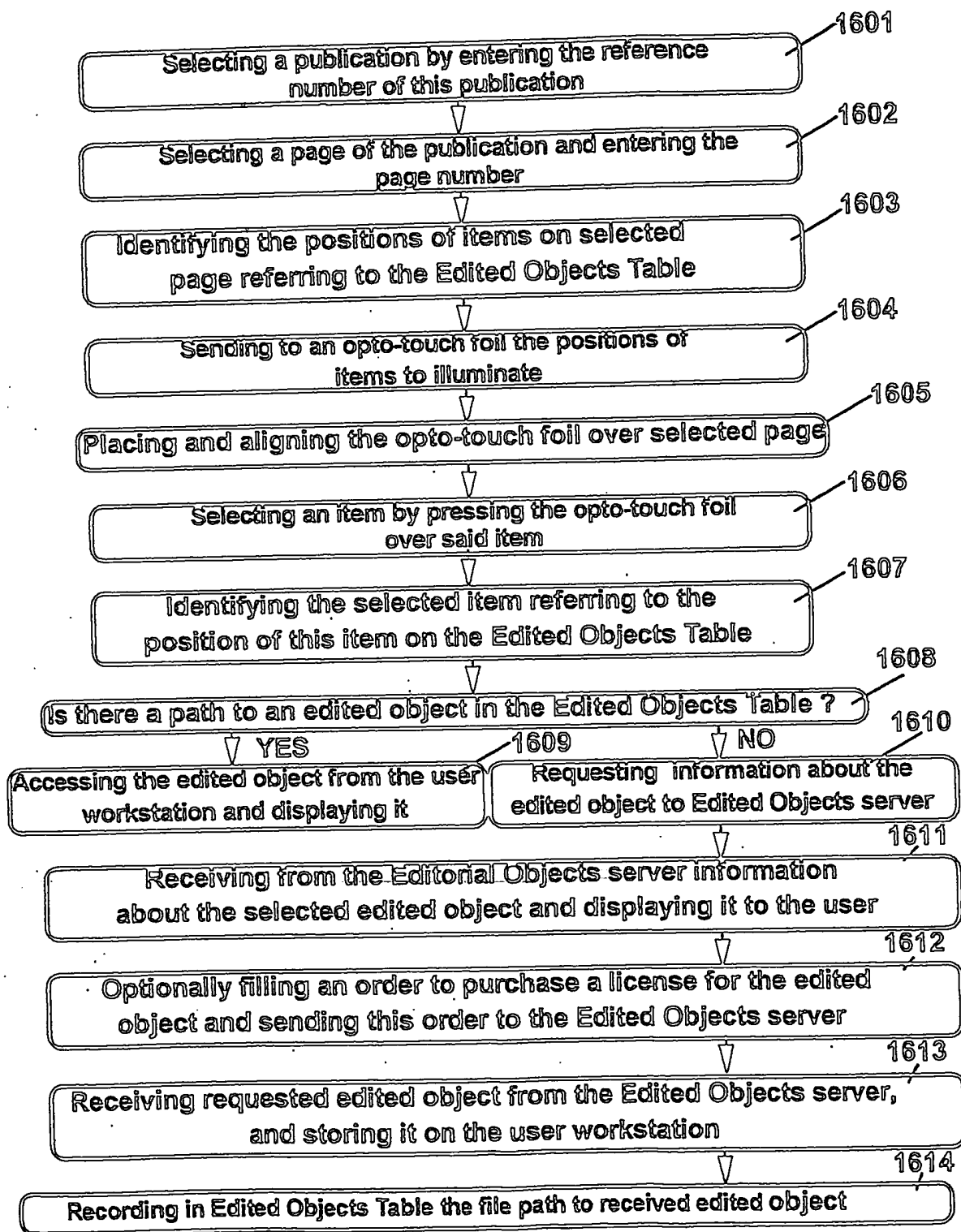


Fig. 16: Method for selecting, ordering, retrieving, accessing and displaying copyrighted edited objects from printed publications

[0039]

[Effect of the Invention] Since according to the information machines and equipment concerning this invention it becomes possible in the condition with the good receiving sensibility of radio to move information machines and equipment since information machines and equipment display the receiving sensibility of radio, and the sensibility of radio can avoid printing in the bad condition, generating of a transmitting error of print data can be controlled.

[0040] Moreover, according to the information machines and equipment concerning this invention, a user can recognize immediately the situation that print data serve as a transmitting error, and can control generating of a transmitting error.

[0041] Moreover, according to the information machines and equipment concerning this invention, before performing actuation for printing, after being able to recognize the duration for transmitting print data and performing actuation for printing, a user can check the duration, can move information machines and equipment, and can control generating of an unexpected transmitting error.

[0042] Moreover, while according to the information machines and equipment concerning this invention a user can recognize the transmitting situation of print data and being able to recognize promptly the fault produced during transmission of print data, a user's mental stress by waiting for transmitting termination of print data is mitigable.

[0043] Moreover, according to the information machines and equipment concerning this invention, doing other activities, after being able to recognize transmitting termination of print data, without seeing the display of information machines and equipment etc. and performing actuation for printing, a user can know transmitting termination of print data and can know that information machines and equipment may be moved.

[0044] Moreover, according to the information machines and equipment concerning this invention, after performing actuation for printing, it can expect that the printout is overdue.

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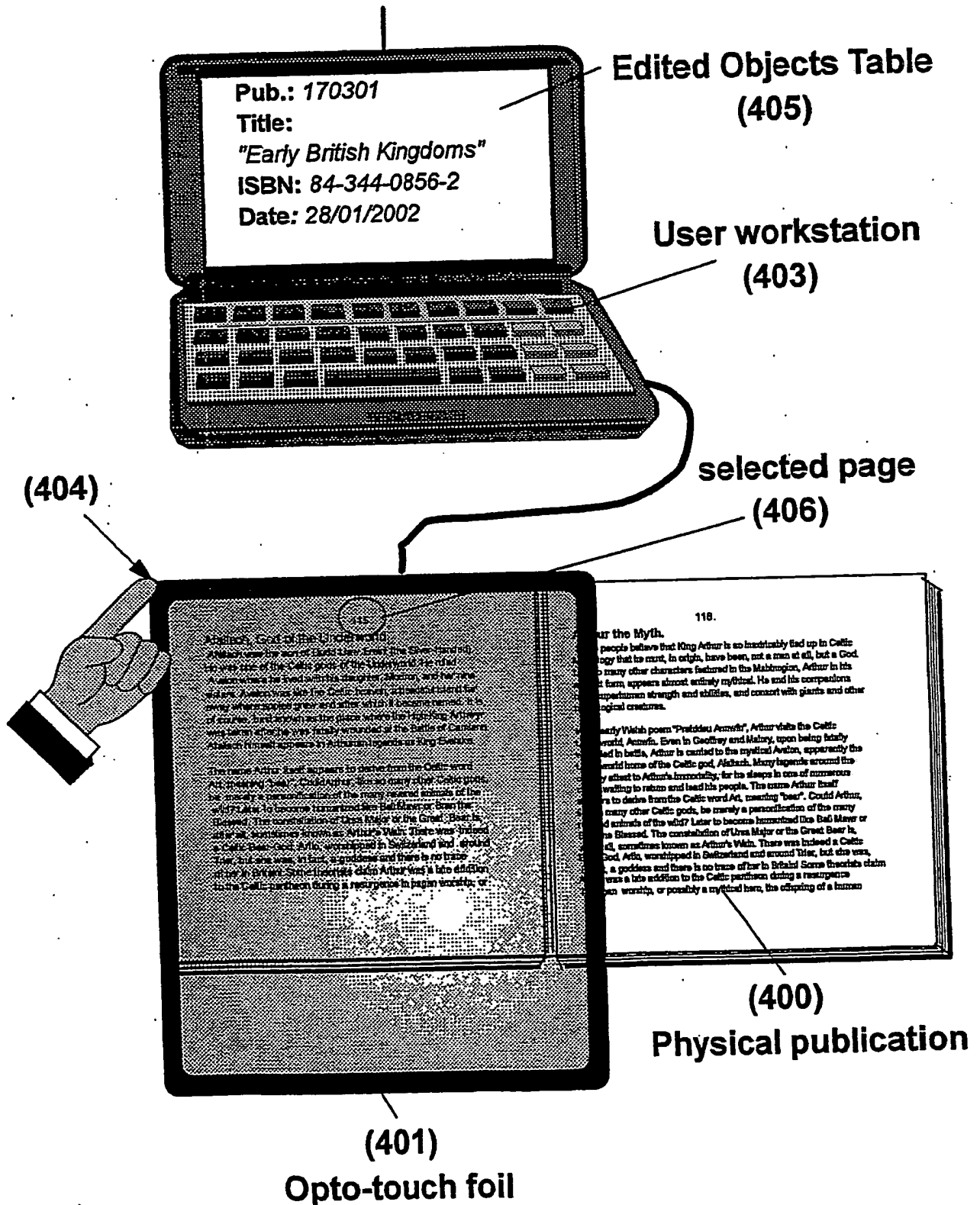


Fig. 4: The user selects a page of physical publication and places aligned transparent opto-touch foil over the selected page

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